blink, your brain knows that you blinked and why you blinked.

The Peripheral Nervous System

The peripheral nervous system is the link between the central nervous system (brain and spinal cord) and the rest of the body. The peripheral nervous system consists of pairs of nerves (43 to be exact) that arise from the brain and spinal cord and lead to organs throughout your body. Many of the nerves in the peripheral nervous system are under the direct control of your conscious mind. For example, when you "tell" your leg to move, a message travels from your brain to your spinal cord and through a peripheral nerve to your leg. There is one part of the peripheral nervous system, however, that is not under the direct control of your conscious mind. This part, called the autonomic (awt-uh-NAHM-ihk) nervous system, controls body activities that are involuntary—that is, body activities that happen automatically without your thinking about them. For example, contractions of the heart muscle and movement of smooth muscles surrounding the blood vessels and the organs of the digestive system are activities under the control of the autonomic nervous system.

The nerves of the autonomic nervous system can be divided into two groups that have opposite effects on the organs they control. One group of nerves triggers an action by an organ while the other group of nerves slows down or stops the action. Thus, the nerves of the autonomic nervous system work against each other to keep body activities in perfect balance.

ACTIVITY DISCOVERING

Fight or Flight?

1. Working with a partner, determine your pulse rate (heartbeats per minute) and breathing rate (breaths per minute) while you are at rest. Record your data.

2. Now do ten jumping jacks. **CAUTION:** *If you have any respiratory illnesses, do not perform steps 2 and 3.*

3. After exercising, measure your pulse rate and breathing rate. Your partner can measure your pulse while you are counting your breaths. Record this "after exercise" data.

Describe any changes in pulse rate and breathing rate after exercising.

- How do these changes compare with those that occur when you are faced with an emergency situation? What other body changes occur when you react to an emergency?

Part of Body Affected	Autonomic Nervous System Nerve Group That Triggers Action	Autonomic Nervous System Nerve Group That Slows Down Action
Pupil of eye	Widened	Narrowed
Liver	Sugar released	None
Urinary bladder muscle	Relaxed	Shortened
Muscle of heart	Increased rate and force	Slowed rate
Bronchi of lungs	Widened	Narrowed

Figure 6–16 *The nerves of the autonomic nervous system can be divided into two groups that have opposite effects on the organs they control.*